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Claims

We claim:

1. A composition having biological activity comprising:

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from about 10 ppm to about 5000 ppm iodonium salt;

from about 100 ppm to about 300,000 ppm of a compound selected from the group consisting of polyvinyl alcohols, polyvinyl acetates, polyethylene glycols, ethylene glycol and propylene glycol block copolymers, cellulosic polymers, polyesters, and alkyd polymers;

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from about 50 ppm to about 50,000 ppm of a compound selected from the group consisting of di-acids, acid anhydrides, polyfunctional acids, di-ethylene glycol, and resorcinol;

an appropriate vehicle selected from the group consisting of water, acidified water, paint, primer, and petroleum distillates.

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2. The composition of claim 1 wherein the iodonium salt have the formula $RI^+R'X^-$ where I is an iodine atom, R and R' are the same or different organic groups.

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3. The composition of claim 2 wherein the organic group is selected from the group consisting of: aryl, aryloxy and heterocyclic groups.

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4. The composition of claim 3 wherein the aryl groups are selected from the compounds consisting of aromatic compounds, single ring aromatic compounds, and polycyclic compounds.

5. The composition of claim 4 wherein the single ring aromatic compounds will have from 5 to 8 carbons.

5 6. The composition of claim 4 wherein the polycyclic compounds are selected from the group consisting of benzenoid aromatic compounds, and non-benzenoid compounds.

10 7. The composition of claim 6 wherein the benzenoid aromatic compounds have from 2 to 10 benzene rings.

15 8. The composition of claim 7 wherein the benzenoid aromatic compound is selected from the group consisting of naphthalene, anthracene, phenanthrene, pyrene, 1,2-benzopyrene, and coronene.

20 9. The composition of claim 6 wherein the non-benzenoid rings include two or more rings each ring having from 4 to 12 carbons.

25 10. The composition of claim 3 wherein the heterocyclic groups are single-ringed compounds or multiple-ringed compounds where at least one of the rings have dissimilar atoms in the ring.

30 11. The composition of claim 10 wherein the heterocyclic ring has carbon atoms and at least one non-carbon atom selected from the group consisting of nitrogen, oxygen, and sulfur.

 12. The composition of claim 10 wherein the heterocyclic ring can be saturated or unsaturated.

35 13. The composition of claim 10 wherein the heterocyclic ring is selected from the group consisting of pyrrole, pyrazole, imidazole, indole, pyridine, pyridazine, pyrimidine, quinoline, piperidine, pyrrolidine, thiazole, purine, thiophene, benzothiophene and furan.

5 14. The composition of claim 3 wherein the organic compound can be substituted with groups selected from the group consisting of halides, alkyl groups, alkoxy groups, vinyl groups, carboxylic acids, esters, ethers, alcohols, and epoxides.

10 15. The composition of claim 14 wherein the alkyl groups have from 1 to 18 carbons.

 16. The composition of claim 14 wherein the alkyl group is selected from straight chain, cyclic or polycyclic alkyls.

15 17. The composition of claim 14 wherein the alkoxy group have from 1 to 18 carbons to define a backbone and have at least one oxygen atom in the backbone.

 18. The composition of claim 1 wherein the composition is a paint for application of a surface submerged below water or soil.

20 19. The composition of claim 1 wherein the composition is applied to a filter media.

25 20. A method for using an iodonium composition comprising the steps of:
from about 10 ppm to about 5000 ppm iodonium salt, from about 100 ppm to about 300,000 ppm of a compound selected from the group consisting of polyvinyl alcohols, polyvinyl acetates, polyethylene glycols, ethylene glycol and propylene glycol block copolymers, cellulosic polymers, polyesters, and alkyd polymers; from about 50 ppm to about 50,000 ppm of a compound selected from the group consisting of di-acids, acid anhydrides, polyfunctional acids, di-ethylene glycol, and resorcinol; and an appropriate vehicle selected from the group consisting of water, acidified water, paint, primer, and petroleum distillates; and

30 applying the composition to a surface to be treated.

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5 21. The method of claim 20 wherein the step of applying the composition to a surface includes the techniques of: spraying, dipping, brushing, roller painting, coating, drip irrigation, and rototilling.

10 22. The method of claim 20 wherein the surface is a filter media.

15 23. The method of claim 22 wherein the step of applying the composition to the surface further includes the step of:
dewatering the filter media.

20 24. The method of claim 23 wherein the dewatering step includes the step of creating an interpenetrating network to adhere the composition to the surface.

25 25. The method of claim 23 further comprising the step of irradiating the filter to cause the iodonium salt to be photolized.

 26. The method of claim 20 wherein the surface is soil.

 27. The method of claim 20 wherein the surface is wood.

30 28. The method of claim 20 wherein the surface is a xylem of a plant.